

124.—QUESTIONS RELATIVE TO MACKEREL AND THE MACKEREL FISHERIES.

The following circular letter and questions have been distributed to captains of mackerel-vessels going south at the opening of the fishing season of 1887 :

The mackerel (*Scomber scombrus*) is one of the most important of the North Atlantic food-fishes. For many years fish of this species have been extensively sold fresh in Northern markets, while salted they form a staple of great commercial importance. Their capture and sale maintains a large industry.

It is considered very desirable to obtain from those engaged in the mackerel fishery a full and carefully prepared account of the habits and migrations of this fish for the present season, as it will be of great value in determining various questions relative to the subject. It is equally important to obtain all information relative to the fisheries of the Gulf of Saint Lawrence, as well as those prosecuted off our own shores.

I beg, therefore, to call attention to the inclosed list of questions as suggestive of the special data desired, and to request answers, at the close of the season, to as many as practicable, to be forwarded by mail addressed to the U. S. Commissioner of Fish and Fisheries, Washington, D. C.

Should you desire it, you will be furnished with a blank book in which to keep a daily record of your observations, so far as practicable, noting under each date items of interest, such as the appearance or non-appearance of mackerel (or other surface fishes, as menhaden, herring, and bluefish), the catch made by your vessel, the locality, condition of weather, &c. At the close of the season this book can be left with any collector of customs, who will forward it to Washington, or it can be sent direct to me by mail at the time of sending the answers to the questions in this circular.

Many very full and satisfactory communications have already been received in response to a former circular containing questions about the mackerel fisheries. Thanking those who have already responded for their efficient aid, I beg to call their attention to this revised series of questions, and to ask that they will read them attentively and add any new suggestions which may occur to them. Attention is especially requested to the questions relating to migrations and to the schooling and spawning habits of the fish.

A.—CHARACTERISTICS.

1. Are the mackerel now caught larger or smaller than those of five, ten, or fifteen years ago?
2. Is there any difference in the size of the mackerel caught at different seasons or on different grounds? Were the first fish the largest?

3. Has the use of the purse-seine in the past, in your opinion, had any influence on the size or fatness of mackerel caught off the New England coast?

B.—MIGRATIONS AND MOVEMENTS.

4. At what date and in what locality did you first see mackerel in the spring of 1887? Was this earlier or later than usual?

5. At what date and in what locality did you catch the first mackerel?

6. At what date and in what locality (approximately) were the first mackerel taken by the Southern fleet?

7. At what date did the mackerel disappear in the fall? Was this earlier or later than usual?

8. At what date and where did you last see mackerel during the season?

9. When the mackerel appeared in the spring, did they come (or show up) in a single large school or in many smaller ones? Were the schools first seen the largest?

10. By what route did they come in to the coast, and what direction did they take subsequently?

11. When going northward in spring what was their greatest and average daily speed, and in what kind of weather did they travel fastest?

12. During their northern migrations in the spring of 1887, at what date and at what distance from the shore did the main body of mackerel pass the principal headlands, as follows: Cape Hatteras, Cape Henry, Cape May, Sandy Hook, Montauk, Nantucket, Cape Sable, Cape Canso, Cape Breton, and Cape North, Cape Breton?

13. What were the favorite localities of the mackerel off the New England coast and in the Gulf of Saint Lawrence this season?

14. How far from the shore have they been seen?

15. How close to the shore and in how shallow water?

16. What percentage of the mackerel caught with purse-seines on the coast of the United States between the 1st of June and the close of the season were taken within 3 miles of land, and what percentage of the mackerel caught by Canadian vessels and boats fishing with purse-seines in the Gulf of Saint Lawrence were caught within 3 miles of land?

17. Are the movements of the fish affected by the presence of other fish preying on them?

18. Are the movements of the fish affected by the temperature, winds, or currents, or by the operations of fishermen using purse-seines?

19. How far south have you known our common mackerel to occur?

C.—ABUNDANCE, ETC.

20. Have mackerel increased or decreased in abundance since 1886?

21. Does their capture with purse-seines affect their abundance?

22. Has the weather of any given summer any influence on the abundance or movements of the fish in the following year?

23. Have the weather and winds from March to June any influence on the movements of the fish and their abundance in the Gulf of Maine (Cape Cod to Nova Scotia) during the summer months?

24. When, where, and in what depth of water do mackerel spawn?

25. Are they as readily caught by hook and line or with purse-seines during the spawning season as at other times?

WASHINGTON, D. C., March 18, 1887.

125.—REPORT OF SHAD DISTRIBUTION FOR 1886.

By MARSHALL McDONALD.

The work of shad propagation and the production of the young for distribution was conducted on the Potomac River at Fort Washington and Central Stations, on the Susquehanna at Battery Station and by the steamer Lookout, and on the Delaware River by the steamer Fish Hawk. Shad for distribution were contributed as follows:

Battery Station, Susquehanna River.....	43,776,000
Central Station, Potomac River.....	28,151,000
Steamer Fish Hawk, Delaware River.....	21,018,000
Steamer Lookout.....	310,000
Total.....	93,255,000

The aggregate number of fry actually planted was 92,679,000. In this distribution liberal plants of shad fry have been made in the Potomac, the Susquehanna, the Delaware, and other tributaries of Chesapeake and Delaware Bays. The following is a summary by river basins of shad distributed during the season of 1886:

River basin.	Received from station.	Actually planted.	Lost in transit.
Tributaries of Narragansett Bay.....	2,534,000	2,534,000
Tributaries of Long Island Sound.....	832,000	749,000	83,000
Hudson River.....	2,312,000	2,312,000
Delaware River.....	21,618,000	21,618,000
Tributaries of Chesapeake Bay.....	52,923,000	52,835,000	88,000
Tributaries of Albemarle Sound.....	1,990,000	1,990,000
Streams draining into the Atlantic south of Albemarle Sound.....	4,288,000	4,183,000	105,000
Mississippi River and minor tributaries of the Gulf of Mexico.....	4,758,000	4,758,000
Colorado River, Gulf of California.....	1,000,000	850,000	150,000
Columbia River basin.....	1,000,000	850,000	150,000
Total.....	93,255,000	92,679,000	576,000

The localities at which the plants were made, the streams in which they were made, and the number of fish included in each deposit are given in the following table: